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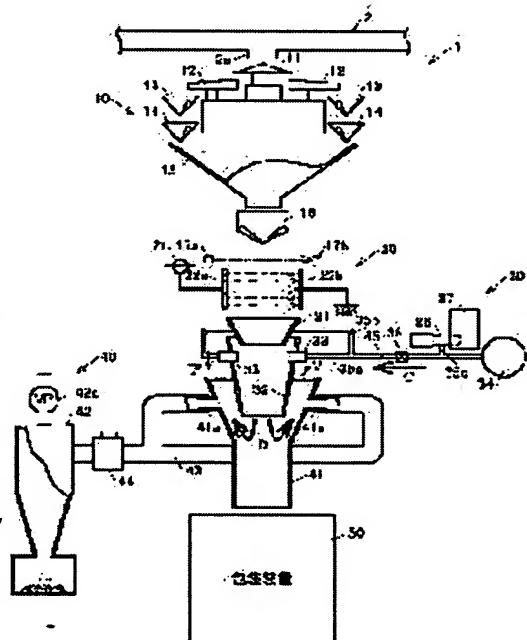
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## (54) APPARATUS FOR SEASONING MERCHANDISE AND SYSTEM FOR CARRYING OUT SEASONING TREATMENT OF MERCHANDISE

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To provide an apparatus and a system capable of carrying out a constant and uniform seasoning treatment at a low cost and having reduced cleaning sites and an excellent operating efficiency during merchandise change.

**SOLUTION:** This apparatus is obtained by installing a pair of electrostatic guns 33 and 33 oppositely arranged with a falling passage for an intermediate product sandwiched therebetween and a seasoning constant rate feeding mechanism 36 for taking out a powdery seasoning in a constant amount per unit time from a seasoning tank 37 for storing the powdery seasoning and feeding the powdery seasoning by falling to a pipe 35 for transporting compressed air to the electrostatic guns 33 and 33 in a seasoning device 30 for applying the powdery seasoning to the intermediate product which is discharged from a combination metering device 10 in the upper side and is falling.



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**CLAIMS**

[Claim(s)]

[Claim 1] The seasoning equipment of the goods characterized by to be had an electrification spraying means is seasoning equipment of goods, and electrify a fine-particles seasoning for the drop path of an intermediate product, and sprinkle for it season this intermediate product by making a fine-particles seasoning adhere to the intermediate product under drop according to an electrostatic operation, a seasoning supply means supply a fine-particles seasoning with air to this electrification spraying means, and the control means which control so that the irrelevance of a fine-particles seasoning becomes fixed.

[Claim 2] A control means is seasoning equipment of the goods according to claim 1 characterized by controlling the amount of the fine-particles seasoning supplied to a seasoning supply means from a seasoning supply source.

[Claim 3] A control means is seasoning equipment of the goods according to claim 1 or 2 characterized by controlling the supply time amount of the air by the seasoning supply means.

[Claim 4] A control means is seasoning equipment of goods given in either of claim 1 to claims 3 characterized by controlling the flow rate of the air by the seasoning supply means.

[Claim 5] Seasoning equipment of goods given in either of claim 1 to claims 4 characterized by having two or more electrification spraying means.

[Claim 6] Two or more electrification spraying means are seasoning equipment of the goods according to claim 5 characterized by being arranged at almost equal spacing around the drop path of an intermediate product.

[Claim 7] Two or more electrification spraying means are seasoning equipment of the goods according to claim 5 characterized by being distributed to a vertical location and arranged in accordance with the drop path of an intermediate product.

[Claim 8] The spraying direction of the fine-particles seasoning by the electrification spraying means is seasoning equipment of goods given in either of claim 1 to claims 7 characterized by being the direction which does not intersect perpendicularly with the drop path of an intermediate product.

[Claim 9] The control means which the metering installation which measures an intermediate product in the amount of Sadashige Tokoro is arranged, and constitutes the above-mentioned seasoning equipment above this seasoning equipment while either of claim 1 to claims 8 is equipped with the seasoning equipment of a publication is the seasoning processing system of the goods characterized by to control the irrelevance of a fine-particles seasoning so that it may become the specified quantity according to the weight of the intermediate product measured with the above-mentioned metering installation.

[Claim 10] It is the seasoning processing system of the goods according to claim 9 characterized by controlling the irrelevance of a fine-particles seasoning so that the package equipment which packs goods [finishing / seasoning equipment / seasoning / caudad] may be arranged and a control means may serve as the specified quantity according to the operating speed of this package equipment or a metering installation.

[Translation done.]

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**DETAILED DESCRIPTION**

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention belongs to the field of food technology about the seasoning processing system of goods, such as snack confectionery, especially goods, such as potato chips.

[0002]

[Description of the Prior Art] Generally, although goods, such as snack confectionery, are packed by package equipment and manufactured by the shipment condition after they are measured with a metering installation by the amount of Sadashige Tokoro, in the case of seasoning goods, such as potato chips, the seasoning activity which seasons intermediate products, such as a slice potato fried in the oil other than the above-mentioned measuring and a package, with the seasoning of a salt or others is done. What a fine-particles seasoning is made to adhere to the front face of the intermediate product under drop uniformly, using an electrostatic operation as equipment which does this seasoning activity, and obtains a seasoning product is indicated by JP,54-44086,A.

[0003] In case it sprinkles a fine-particles seasoning, the equipment indicated by this official report generates potential between an intermediate product and a fine-particles seasoning, drops an intermediate product in the floating fine-particles seasoning, covers all the front faces of an intermediate product, and makes a fine-particles seasoning adhere uniformly according to an electrostatic operation by giving high potential to this fine-particles seasoning.

[0004]

[Problem(s) to be Solved by the Invention] By the way, in the case of goods, such as snack confectionery, of course, it is required for front faces, such as potato chips, to adhere to the seasoning uniformly, but it is important to adhere to the seasoning of a constant rate from the taste side in addition. that is, a \*\*\*\*\* [ that seasoning demanded and seasoning of the thickness which is said further and which will be demanded if it becomes are made certainly ] -- \*\* -- saying influences the sale of goods. Therefore, the seasoning equipment formed in the production line of goods is asked for performing equal seasoning processing to an intermediate product to the bottom of the situation of always changing the amount of a target product.

[0005] On the other hand, in order to perform equal seasoning processing to an intermediate product, in having used many fine-particles seasonings for \*\*, it will lead to buildup of a manufacturing cost, as a result the jump of a product price will be caused, and a meaningless costs burden will be forced upon a consumer. Therefore, holding down the amount of the seasoning used to a necessary minimum amount is also the technical problem which must be solved simultaneously.

[0006] Furthermore, it is also necessary to realize seasoning processing equal continuous moreover always in constraint called fixed processing speed.

[0007] About these points, consideration is not made at all, and by the time equipment given in the above-mentioned official report satisfies the needs of a consumer or a manufacturer, it will not have resulted.

[0008] Furthermore, when this kind of equipment is used, after the product after seasoning is

supplied to metering installations, such as a combination metering installation, and is measured by predetermined weight, package equipment is supplied usually further, therefore it can consider generating of the following nonconformities.

[0009] That is, since the product with which the metering installation adhered to the seasoning is supplied, a seasoning will adhere to the part to which the product of the product supply path to this metering installation or this each part of a metering installation contacts directly. Therefore, when processing the goods of different seasoning using the same system, in order to hold the taste uniformly, a system will be stopped at every goods substitute and each part of the above-mentioned supply path or a metering installation must be cleaned.

[0010] moreover , in order for the seasoning use for this kind of goods to have many things containing salinity , therefore to become easy to generate rust in the supply path and each part of a metering installation to which this seasoning adhered , to produce the problem on food sanitation hygiene , to produce poor actuation of a system and to prevent this , it must clean much more frequently .

[0011] Then, seasoning processing fixed and equal as this kind of seasoning equipment and the seasoning processing system of goods is cheaply possible for this invention, moreover, there are few cleaning parts and it makes it a technical problem to offer equipment excellent in the workability at the time of a goods substitute, and a system.

[0012]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, it is characterized by constituting the invention in this application as follows.

[0013] First, invention according to claim 1 is a thing about the seasoning equipment of the goods which season this intermediate product by making a fine-particles seasoning adhere to the intermediate product under drop according to an electrostatic operation. It is characterized by having an electrification spraying means to electrify a fine-particles seasoning for the drop path of an intermediate product, and to sprinkle for it, a seasoning supply means to supply a fine-particles seasoning to this electrification spraying means with air, and the control means controlled so that the irrelevance of a fine-particles seasoning becomes fixed.

[0014] According to this invention, since the fine-particles seasoning set constant [ irrelevance ] floats for the drop path of an intermediate product, constant-rate adhesion of this fine-particles seasoning will be carried out on the surface of an intermediate product. And since the fine-particles seasoning is charged, an intermediate product will adhere to it uniformly. Therefore, the quality of a seasoning product is stabilized and it comes to be secured.

[0015] Although there is a possibility of a fine-particles seasoning not adhering to an intermediate product it being the method which sprinkles a fine-particles seasoning good, and a fine-particles seasoning inclining this intermediate product being a superficial configuration toward one side of an intermediate product, and moreover adhering from an one direction especially, since an electrostatic operation is used, according to the above-mentioned invention, these concern is mitigated.

[0016] And invention according to claim 2 is characterized by a control means controlling the amount of the fine-particles seasoning supplied to a seasoning supply means from a seasoning supply source in the seasoning equipment of above-mentioned claim 1.

[0017] Moreover, invention according to claim 3 is characterized by a control means controlling the supply time amount of the air by the seasoning supply means in the seasoning equipment of above-mentioned claim 1 or claim 2.

[0018] And invention according to claim 4 is characterized by a control means controlling the flow rate of the air by the seasoning supply means in one seasoning equipment of above-mentioned claim 1 to claims 3.

[0019] Since it becomes possible to control by these invention of any the irrelevance of the fine-particles seasoning which is supplied with air and sprinkled by the electrification spraying means with a sufficient precision, the quality of a seasoning product is stabilized further and comes to be secured.

[0020] The irrelevance of a desired fine-particles seasoning is easily obtained by controlling the amount of the fine-particles seasoning supplied to this air, after seting constant especially the

conditions of the supply time amount and the flow rate of air.

[0021] Moreover, invention according to claim 5 is characterized by having two or more electrification spraying means in one seasoning equipment of above-mentioned claim 1 to claims 4.

[0022] According to this invention, since a fine-particles seasoning can be sprinkled with two or more electrification spraying means, this fine-particles seasoning not only being made to adhere to an intermediate product much more uniformly but it becomes possible to control the irrelevance of a fine-particles seasoning often [ precision ] and finely further further. Moreover, since the remaining electrification spraying means can be controlled so that the irrelevance of a fine-particles seasoning becomes fixed even when one electrification spraying means suspends actuation, for example, it becomes maintainable [ productivity ].

[0023] Furthermore, invention according to claim 6 is characterized by arranging two or more electrification spraying means at almost equal spacing around the drop path of an intermediate product in the seasoning equipment of above-mentioned claim 5.

[0024] Since equal spacing is moreover kept from two or more directions and a fine-particles seasoning is sprinkled, this fine-particles seasoning can be made to adhere much more uniformly with an intermediate product according to this invention. If a fine-particles seasoning is supplied only from one side like especially potato chips in the case of the superficial intermediate product of a configuration, it will become possible to mitigate further a possibility that a seasoning may incline and adhere to one side of this intermediate product.

[0025] And invention according to claim 7 is characterized by distributing two or more electrification spraying means to a vertical location, and arranging them in accordance with the drop path of an intermediate product, in the seasoning equipment of above-mentioned claim 5.

[0026] Even when it speeds up [ of an intermediate product / drop ], for example, a fine-particles seasoning can be made according to this invention, to adhere to an intermediate product good, since the die length of the spraying space of the fine-particles seasoning in the drop direction of an intermediate product becomes long.

[0027] Moreover, invention according to claim 8 is characterized by the spraying direction of the fine-particles seasoning by the electrification spraying means being a direction which does not intersect perpendicularly with the drop path of an intermediate product in one seasoning equipment of above-mentioned claim 1 to claims 7.

[0028] According to this invention, since it is sprinkled so that a fine-particles seasoning may not check the flow of the falling intermediate product, a drop rate will be maintained by the smooth drop list of an intermediate product, and high-speed operational status will be maintained.

[0029] Moreover, this concern comes to be mitigated by the above-mentioned invention, although there is a possibility that nonconformities, such as a bite lump of the intermediate product to the wrapping material seal section in package equipment, may arise when package equipment is arranged, for example under this seasoning equipment, and the drop rate of the intermediate product under drop changes suddenly.

[0030] On the other hand, invention according to claim 9 is a thing about the seasoning processing system of goods. While either of claim 1 to claims 8 is equipped with the seasoning equipment of a publication The control means which the metering installation which measures an intermediate product in the amount of Sadashige Tokoro is arranged, and constitutes the above-mentioned seasoning equipment above this seasoning equipment is characterized by controlling the irrelevance of a fine-particles seasoning so that it may become the specified quantity according to the weight of the intermediate product measured with the above-mentioned metering installation.

[0031] Usually, although the consumption of the sprinkled fine-particles seasoning is fluctuated according to the weight of the intermediate product which is discharged from a metering installation and falls Since according to this invention the irrelevance of a fine-particles seasoning is changed according to it when there is a change of product weight, for example in a metering installation the increment in the fine-particles seasoning to which the intermediate product by the excess of spraying of a fine-particles seasoning did not adhere, and spraying of a

fine-particles seasoning -- nonconformities, such as lack of seasoning of the intermediate product twisted too little, are prevented, and the product with which fixed seasoning was always made comes to be obtained.

[0032] Moreover, since an intermediate product is seasoned by downward seasoning equipment after it is measured with a metering installation by the amount of Sadashige Tokoro, it is lost that a seasoning adheres of it to the part to which the product of the product supply way to a metering installation or this each part of a metering installation contacts directly, and it becomes unnecessary cleaning it these parts at the time of a goods substitute.

[0033] And in the seasoning processing system of above-mentioned claim 9, caudad, invention according to claim 10 is characterized by controlling the irrelevance of a fine-particles seasoning so that the package equipment which packs the goods [ finishing / seasoning ] of seasoning equipment may be arranged and a control means may serve as the specified quantity according to the operating speed of this package equipment or a metering installation.

[0034] Usually, although the consumption of the sprinkled fine-particles seasoning is fluctuated according to the count of drop supply of the intermediate product per the operating speed of package equipment or a metering installation, and unit [ in other words ] time amount in seasoning equipment Since according to this invention the irrelevance of a fine-particles seasoning is changed according to it when package equipment or a metering installation has the change of an operating speed, for example the increment in the fine-particles seasoning to which the intermediate product by the excess of spraying of a fine-particles seasoning did not adhere like invention of above-mentioned claim 9, and spraying of a fine-particles seasoning -- nonconformities, such as lack of seasoning of the intermediate product twisted too little, are prevented, and the product with which fixed seasoning was always made comes to be obtained.

[0035] It will be supplied while a product moreover falls from a metering installation to package equipment through seasoning equipment, and each activity of measuring, seasoning, and a package will often be done continuously.

[0036]

[Embodiment of the Invention] Hereafter, the seasoning processing system of the goods concerning the gestalt of operation of this invention is explained.

[0037] As shown in drawing 1 , this seasoning processing system 1 is arranged on the lower stream of a river of the transport device 2 for carrying out distribution supply while it conveys an intermediate product, and has the combination metering installation 10, electrification equipment 20, seasoning equipment 30, the fine-particles seasoning recovery system 40, and package equipment 50.

[0038] The distributed excitation-type table 11 which the above-mentioned combination metering installation 10 countered under the distributed feed hopper 2a of a transport device 2, and was installed, Two or more radiation troughs 12--12 arranged around this distributed table 11 at the radial, The pool hopper 13--13 and scale hopper 14--14 of a vertical couple by which the circular disposition was carried out corresponding to this radiation trough 12--12, It has the set chute 15 installed under the above-mentioned scale hopper 14--14, and the timing hopper 16 installed directly under [ exhaust port ] the soffit section of this set chute 15. Moreover, the photoelectrical-type article sensors 17a and 17b of the above-mentioned timing hopper 16 which detect passage of an intermediate product caudad are installed.

[0039] By carrying out like this, the intermediate product supplied on the distributed table 11 is supplied to the radiation trough 12--12 through the pool hopper 13--13 at a scale hopper 14--14, after distributed supply is carried out, the weight of an intermediate product is measured by this scale hopper 14--14, and a combination operation is performed. And as a result of a combination operation, an intermediate product is discharged from the scale hopper 14--14 corresponding to the combination used as predetermined weight, and it is gathered and discharged with the set chute 15, and is stored by the timing hopper 16. If the switching action of this timing hopper 16 is carried out based on the signal from downward package equipment 50 and there is a blowdown demand signal from package equipment 50, open actuation will be carried out and the above-mentioned intermediate product will be discharged caudad. And passage of the intermediate product which is discharged by the article sensors 17a and 17b, and

falls is detected.

[0040] Moreover, the above-mentioned electrification equipment 20 is arranged so that it may counter on both sides of the drop path of an intermediate product, and it has the electrodes 22a and 22b of a couple with which another side was grounded while one side is connected to a high voltage power supply 21. By carrying out like this, the intermediate product under drop is charged in a predetermined polarity, while passing through the electric-field space formed between these electrode 22a and 22b.

[0041] And the above-mentioned seasoning equipment 30 which is the description section of this invention is equipped with the taking-in chute 31 which incorporates the intermediate product charged in the predetermined polarity with the above-mentioned electrification equipment 20, and the seasoning chute 32 in which face soffit section opening of this taking-in chute 31, and the upper bed section carries out opening.

[0042] Equal spacing is kept in the perimeter of the lower part of soffit section opening of the taking-in chute 31, and the drop path of an intermediate product, and while sprinkling a fine-particles seasoning to the method of the inside of the seasoning chute 32, the electrostatic guns 33 and 33 of the couple which electrifies a fine-particles seasoning in a predetermined polarity are attached in the above-mentioned seasoning chute 32. And the branch pipes 35a and 35b of the piping 35 as a seasoning supply means prolonged from the compressor 34 which is the supply source of compression air which branch by the downstream comparatively are connected to these electrostatic guns 33 and 33, respectively. Moreover, the seasoning constant feeding device 36 of screw drop-out is connected to branch pipe 35c of the above-mentioned piping 35 which branches by the upstream comparatively. One edge of this seasoning constant feeding device 36 is inserted into the seasoning tank 37 which stores a fine-particles seasoning.

[0043] Here, drawing 2 explains the above-mentioned electrostatic guns 33 and 33 in detail.

[0044] the electrostatic guns 33 and 33 of a couple -- the same flat-surface top -- and it is attached in the peripheral wall of the seasoning chute 32 so that the edge which sprinkles a fine-particles seasoning may counter mutually. Moreover, the edge which sprinkles the fine-particles seasoning of each electrostatic guns 33 and 33 is equipped with the deflectors 33a and 33a made into the configuration whose diameter is expanded in the shape of a trumpet, respectively, so that it goes to a way among the seasoning chutes 32, and the fine-particles seasoning sprinkled through this edge is diffused as an arrow head A shows.

[0045] Next, drawing 3 explains the above-mentioned seasoning constant feeding device 36 in detail.

[0046] This seasoning constant feeding device 36 is what carries out drop supply of the fine-particles seasoning in the seasoning tank 37 at piping 35 as ejection and an arrow head B show only a constant rate per unit time amount. It is attached in the point side of output-shaft 36a' of drive-motor 36a and this drive-motor 36a, and has outer case member 36c which holds screw 36b, and these output-shafts 36a' and screw 36b for conveying a fine-particles seasoning from the method of the drawing right to a left. And opening 36c' for incorporating a fine-particles seasoning in this outer case member 36c is prepared in the predetermined part of the method of the drawing right of the above-mentioned outer case member 36c inserted into the seasoning tank 37.

[0047] Furthermore, while 36d of air openings which incorporate air in the upper part is prepared in the predetermined part of outer case member 36c of drive-motor 36a approach, branch pipe 35c of piping 35 is connected to the lower part.

[0048] Moreover, as shown in drawing 1, while carrying out closing motion control of the flow of the air which contains the fine-particles seasoning shown by the arrow head C in the middle of the piping 35 inserted by branch pipe 35c, and branch pipe 35a thru/or 35b, the change-over bulb 38 for carrying out control of flow is formed.

[0049] And if the control system of the above-mentioned seasoning equipment 30 is explained, as shown in drawing 4, this seasoning equipment 30 will be equipped with the control section 39 which controls this in the gross, and this control section 39 will output the control signal for actuation control to the electrostatic guns 33 and 33 with which seasoning equipment 30 was equipped, the seasoning constant feeding device 36, and the change-over bulb 38.

[0050] Moreover, a control section 39 inputs the combination measuring signal of the intermediate product from the combination metering installation 10, and the article passage signal from the article sensors 17a and 17b of the combination metering installation 10, outputs the control signal for actuation control to the change-over bulb 44 (after-mentioned) of the fine-particles seasoning recovery system 40, and inputs the blowdown demand signal from package equipment 50.

[0051] Furthermore, the above-mentioned control section 39 outputs the control signal for actuation control to electrification equipment 20 while inputting data, such as applied voltage for example, from electrification equipment 20 to electrode 22a.

[0052] On the other hand, as shown in drawing 1, the above-mentioned fine-particles seasoning recovery system 40 is equipped with the discharge charge 41 in which faces package equipment 50 and the sofit section carries out opening while the lower part of the above-mentioned seasoning chute 32 fits in, and the attraction openings 41a and 41a of the couple of this discharge charge 41 comparatively prepared in the upper part and the cyclone recovery machine 42 which carries out attraction recovery of the excessive fine-particles seasoning are considered as the configuration connected for piping 43. Moreover, the above-mentioned cyclone recovery machine 42 is exhausted by vacuum-pump 42a. And in the middle of the piping 43 of the near side of the cyclone recovery machine 42, the change-over bulb 44 for carrying out on-off control of the recovery of a fine-particles seasoning is formed.

[0053] Next, actuation of the above-mentioned seasoning processing system 1 is explained.

[0054] First, the passage will be detected by the article sensors 17a and 17b, if the intermediate product supplied to the combination metering installation 10 of the seasoning processing system 1 through distribution feed hopper 2a prepared in the transport device 2 is measured by the amount of Sadashige Tokoro and is caudad discharged by this combination metering installation 10. The control section 39 of seasoning equipment 30 will operate the electrostatic guns 33 and 33, if an article passage signal is inputted.

[0055] After being discharged from the combination metering installation 10, drop supply of the intermediate product charged in the predetermined polarity is carried out through the taking-in chute 31 at the seasoning chute 32 by electrification equipment 20. On the other hand, in the inside of piping 35, if the fine-particles seasoning of a constant rate is picked out from the seasoning tank 37 by the seasoning constant feeding device 36 per unit time amount and drop supply is carried out through branch pipe 35c to piping 35, a fine-particles seasoning will be conveyed with compression air, as an arrow head C shows. And this fine-particles seasoning is charged in the polarity of reverse with a predetermined polarity, i.e., the polarity of the above-mentioned intermediate product, while it is sprinkled from the electrostatic guns 33 and 33 of a couple through branch pipes 35a and 35b by the method of the inside of the seasoning chute 32.

[0056] In that case, from the method of the drawing 3 right, only a constant rate is stabilized per unit time amount for piping 35 through branch pipe 35c by the fine-particles seasoning conveyed by the left by the air attracted from 36d of air openings, and drop supply is carried out by the revolution of screw 36b with which the seasoning constant feeding device 36 was equipped. Consequently, for the drop path of an intermediate product, the fine-particles seasoning which it set constant [irrelevance] will float, and constant-rate adhesion of this fine-particles seasoning will be carried out on the front face of the falling intermediate product. Therefore, the seasoning product with which predetermined seasoning was made is obtained.

[0057] And with the polarity of an intermediate product, since the intermediate product charged in the predetermined polarity falls the inside of the ambient atmosphere of the fine-particles seasoning which is charged in the polarity of reverse and is carrying out distributed floating depending on the method of the inside of the seasoning chute 32, an intermediate product will adhere to a fine-particles seasoning certainly uniformly on all front faces according to an electrostatic operation.

[0058] And since it was made to output a control signal to electrification equipment 20 and the electrostatic guns 33 and 33 based on the input data from electrification equipment 20, the control section 39 with which seasoning equipment 30 was equipped enables it to change extent of electrification of an intermediate product and a fine-particles seasoning, respectively.

therefore -- for example, a fine-particles seasoning can be made to adhere to an intermediate product always uniformly and uniformly by enlarging the potential difference between an intermediate product and a fine-particles seasoning in the seasoning processing activity under a humid environment now

[0059] Moreover, if the rotational frequency of screw 36b of the seasoning constant feeding device 36 is controlled by the control section 39 If the supply time amount of the air which contains a fine-particles seasoning by closing motion control of the change-over bulb 38 prepared in the middle of piping 35 is controlled since the amount of the fine-particles seasoning by which drop supply is carried out can be changed into piping 35 and Or while modification to arbitration of the irrelevance of a fine-particles seasoning will be attained since the amount of the fine-particles seasoning supplied to the electrostatic guns 33 and 33 can be changed if the flow rate of the air which contains a fine-particles seasoning by control of flow is controlled, it becomes possible to control irrelevance with a sufficient precision.

[0060] And since the electrostatic guns 33 and 33 of a couple were attached in the seasoning chute 32 so that it might counter mutually at equal spacing, when one electrostatic gun 33 is attached, it compares. It not only becomes possible to control the irrelevance of a fine-particles seasoning often [ precision ] and finely further further, but Since equal spacing is moreover kept from a 2-way and a fine-particles seasoning is sprinkled, the nonconformity that incline toward one side and a fine-particles seasoning adheres like especially potato chips also in the case of the superficial intermediate product of a configuration is mitigated.

[0061] Moreover, since the edge which sprinkles the fine-particles seasoning of the above-mentioned electrostatic guns 33 and 33 was equipped with Deflectors 33a and 33a, respectively, it is lost that the fine-particles seasoning which will be sprinkled in the direction which does not intersect perpendicularly with the drop path of an intermediate product, and is sprinkled checks smooth drop of an intermediate product of a fine-particles seasoning. Therefore, high-speed operational status will be maintained.

[0062] Furthermore, since it became possible to change the irrelevance of a fine-particles seasoning into arbitration by the control section 16 as described above, when there is a change of product weight, the irrelevance of a fine-particles seasoning can be controlled to become the specified quantity according to the weight of an intermediate product by inputting the combination measuring signal of the intermediate product in the combination metering installation 10. Consequently, the excess of spraying or the nonconformity of too little of a fine-particles seasoning is prevented, and the product with which fixed seasoning was always made comes to be obtained.

[0063] Since it is seasoned by downward seasoning equipment 30 after an intermediate product is moreover measured with the combination metering installation 10 by the amount of Sadashige Tokoro, it is lost that a seasoning adheres to the part to which the product of the product supply way to the combination metering installation 10 or combination metering installation 10 each part of this contacts directly, and cleaning of these parts at the time of a goods substitute becomes unnecessary.

[0064] Moreover, since it became possible to change the irrelevance of a fine-particles seasoning into arbitration by the control section 16 as similarly described above, when the combination metering installation 10 or package equipment 50 has the change of an operating speed, the irrelevance of a fine-particles seasoning can be controlled to become the specified quantity according to the count of an input of the article passage signal in the combination metering installation 10 corresponding to an operating speed, or the count of an input of the blowdown demand signal from package equipment 50. Consequently, the excess of spraying or the nonconformity of too little of a fine-particles seasoning is prevented, and the product with which fixed seasoning was always made comes to be obtained.

[0065] It will be supplied while a product moreover falls from the combination metering installation 10 to package equipment 50 through seasoning equipment 30, and each activity of measuring, seasoning, and a package will often be done continuously.

[0066] And the packed product packed with the predetermined wrapping material is received and passed to quality inspection devices, such as a weight checker and a seal checker, by the

above-mentioned package equipment 50.

[0067] The fine-particles seasoning to which it was sprinkled by the method of the inside of the seasoning chute 32, and an intermediate product did not adhere on the other hand Since it is recovered by the cyclone recovery machine 42 through a discharge charge 41 as an arrow head D (refer to drawing 1 ) shows by carrying out open actuation of the change-over bulb 44, while the futility of a fine-particles seasoning is prevented In the package equipment 50 arranged under the discharge charge 41, the nonconformity that an excessive seasoning is supplied and wrapped in in addition to a seasoning product is avoided. Furthermore, it becomes reusable [ the collected fine-particles seasoning ].

[0068] In addition, in the gestalt of the above-mentioned implementation, although the electrostatic guns 33 and 33 of a couple were used, many electrostatic guns 33--33 may be used further. By carrying out like this, the irrelevance of the fine-particles seasoning which floats to the method of the inside of the seasoning chute 32 can be controlled now still more easily. And since the electrostatic guns 33 and 33 of a up Norikazu pair are formed in the perimeter of the drop path of an intermediate product, the fine-particles seasoning sprinkled by these electrostatic guns 33 and 33 adheres to the front face of the intermediate product under drop uniformly, but if many electrostatic guns 33--33 are used further, a fine-particles seasoning will adhere much more uniformly by the front face of an intermediate product, and equalization of seasoning will be attained.

[0069] Moreover, in the gestalt of the above-mentioned implementation, although explanation was omitted about the case where distributed two or more electrostatic guns 33 and 33 to the vertical location, and they have been arranged in accordance with the drop path of an intermediate product, the front face of the intermediate product under drop will adhere to a fine-particles seasoning uniformly like the above also in this case. Furthermore, even when it speeds up [ of an intermediate product / drop ], for example, a fine-particles seasoning can be made to adhere to an intermediate product good, since the die length of the spraying space of the fine-particles seasoning in the drop direction of an intermediate product becomes long.

[0070] And in the gestalt of the above-mentioned implementation, although the seasoning constant feeding device 36 of the screw drop-out by screw 36b which carried out level arrangement to this piping 35 was used for supply of the fine-particles seasoning to piping 35, what carried out vertical disposition of the screw to the above-mentioned piping 35 may be used. Moreover, the constant feeding devices in which replaced with the seasoning constant feeding device 36 of screw drop-out, in addition it was suitable for little quantum conveyance of fine particles, such as a vibrating feeder type and an ultrasonic conveyance type, may be used.

[0071] Moreover, in the gestalt of the above-mentioned implementation, although the timing hopper 16 and the taking-in chute 31 were used, these can be excluded for the reasons of constraint of an installation tooth space etc.

[0072] And when you do not need seasoning processing of coating weight accurate for example exceptionally, you do not need to make it interlock in the gestalt of the above-mentioned implementation, although it controlled so that electrification equipment 20 and seasoning equipment 30 interlocked by the control section 39.

[0073] Moreover, in the gestalt of the above-mentioned implementation, since an intermediate product falls contacting the set chute 15, if this set chute 15 is grounded, it can exclude electrification equipment 20. Furthermore, if a control section 39 inputs the blowdown signal from the combination metering installation 10, the article sensors 17a and 17b can be excluded.

[0074]

[Effect of the Invention] Since it controlled to set the irrelevance of a fine-particles seasoning constant according to this invention as explained above, the seasoning product with which fixed seasoning was made is stabilized, and, moreover, it is secured cheaply. Moreover, an intermediate product adheres to a fine-particles seasoning certainly and uniformly according to an electrostatic operation. Since it is moreover discharged from a metering installation, a fine-particles seasoning is made to adhere to the intermediate product under drop and the seasoning product was obtained, the part where a seasoning contacts is reduced and the seasoning processing system excellent in cleaning nature or workability is realized. Especially this invention

is suitable for the combination measuring field of the food which can respond to the taste to diversify.

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[Translation done.]

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the outline block diagram of the seasoning processing system concerning the gestalt of operation of this invention.

[Drawing 2] It is the important section expanded sectional view which meets the A-A line of drawing 1.

[Drawing 3] a part of explaining a seasoning constant feeding device sake --- it is a fracture important section enlarged drawing.

[Drawing 4] It is control-system drawing.

[Description of Notations]

1 Seasoning Processing System

10 Combination Metering Installation (Metering Installation)

30 Seasoning Equipment

33 Electrostatic Gun (Electrification Spraying Means)

35 Piping (Seasoning Supply Means)

37 Seasoning Tank (Seasoning Supply Source)

39 Control Section (Control Means)

50 Package Equipment

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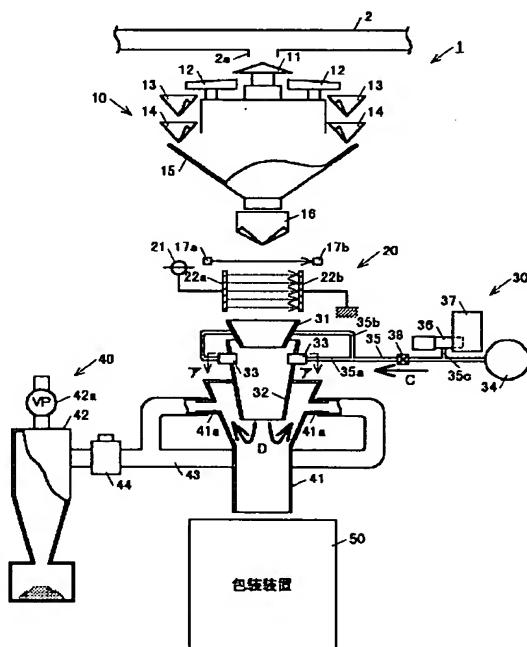
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(54)【発明の名称】商品の味付け装置及び商品の味付け処理システム

(57)【要約】

【課題】一定且つ均等な味付け処理が安価に可能であり、しかも清掃部位が少なく、商品替え時の作業性に優れた装置やシステムを提供することを課題とする。

【解決手段】上方の組合せ計置装置10から排出されて落下中の中間製品に粉体調味料を付着させる味付け装置30に、中間製品の落下経路を挟んで対向配置した一対の静電ガソ33,33と、該静電ガソ33,33に圧縮エアを搬送する配管35へ、粉体調味料を貯留する調味料タンク37から単位時間当たり一定量の粉体調味料を取り出して落下供給する調味料定量供給機構36とを備える。



## 【特許請求の範囲】

【請求項1】 落下中の中間製品に粉体調味料を静電作用によって付着させることにより、該中間製品を味付けする商品の味付け装置であって、中間製品の落下経路に粉体調味料を帯電させて散布する帯電散布手段と、該帯電散布手段に粉体調味料をエアと共に供給する調味料供給手段と、粉体調味料の散布量が一定となるように制御する制御手段とが備えられていることを特徴とする商品の味付け装置。

【請求項2】 制御手段は、調味料供給源から調味料供給手段に供給される粉体調味料の量を制御することを特徴とする請求項1に記載の商品の味付け装置。

【請求項3】 制御手段は、調味料供給手段によるエアの供給時間を制御することを特徴とする請求項1または請求項2に記載の商品の味付け装置。

【請求項4】 制御手段は、調味料供給手段によるエアの流量を制御することを特徴とする請求項1から請求項3のいずれかに記載の商品の味付け装置。

【請求項5】 複数の帯電散布手段が備えられていることを特徴とする請求項1から請求項4のいずれかに記載の商品の味付け装置。

【請求項6】 複数の帯電散布手段は、中間製品の落下経路の周囲にほぼ均等な間隔で配置されていることを特徴とする請求項5に記載の商品の味付け装置。

【請求項7】 複数の帯電散布手段は、中間製品の落下経路に沿って上下位置に分配されて配置されていることを特徴とする請求項5に記載の商品の味付け装置。

【請求項8】 帯電散布手段による粉体調味料の散布方向は、中間製品の落下経路と直交しない方向であることを特徴とする請求項1から請求項7のいずれかに記載の商品の味付け装置。

【請求項9】 請求項1から請求項8のいずれかに記載の味付け装置が備えられていると共に、この味付け装置の上方に、中間製品を所定重量に計量する計量装置が配置され、且つ上記味付け装置を構成する制御手段は、上記計量装置で計量された中間製品の重量に応じた所定量となるように、粉体調味料の散布量を制御することを特徴とする商品の味付け処理システム。

【請求項10】 味付け装置の下方に、味付け済みの商品を包装する包装装置が配設され、且つ、制御手段は、該包装装置または計量装置の運転速度に応じた所定量となるように、粉体調味料の散布量を制御することを特徴とする請求項9に記載の商品の味付け処理システム。

## 【発明の詳細な説明】

## 【0001】

【発明の属する技術分野】本発明は、スナック菓子等の商品、特にポテトチップ等の商品の味付け処理システムに関し、食品製造技術の分野に属する。

## 【0002】

【従来の技術】一般にスナック菓子等の商品は、計量裝

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置によって所定重量に計量された後、包装装置によって包装されて出荷状態に製造されるが、ポテトチップ等の味付け商品の場合は、上記の計量、包装作業の他に、油で揚げられたスライスピート等の中間製品を塩やその他の調味料によって味付けする味付け作業が行われる。この味付け作業を行う装置としては、静電作用を用いて落下中の中間製品の表面に粉体調味料を均等に付着させて味付け製品を得るものが、例えば特開昭54-44086号に開示されている。

【0003】この公報に開示された装置は、粉体調味料を散布する際、該粉体調味料に高電位を与えることにより、中間製品と粉体調味料との間に電位を発生させ、浮遊する粉体調味料中に中間製品を落下させて、静電作用によって粉体調味料を中間製品の全表面に亘り均等に付着させるものである。

## 【0004】

【発明が解決しようとする課題】ところで、スナック菓子等の商品の場合、調味料がポテトチップ等の表面に均等に付着されていることはもちろん必要であるが、加えて嗜好面から、一定量の調味料が付着されていることが重要となっている。つまり、要望される味付け、さらにはいうならば要望される濃さの味付けが確実になされているか否かということが、商品の売れ行きを左右するのである。そのため、商品の生産ラインに設けられた味付け装置には、対象商品の量が常に変動する状況下においても、中間製品に対して均等な味付け処理を施すことが求められる。

【0005】一方、中間製品に対して均等な味付け処理を施すために、徒に多くの粉体調味料を使用したのでは製造コストの増大につながり、ひいては製品価格の高騰を招くこととなり、消費者に無意味な費用負担を強いることになる。そのため、調味料の使用量を必要最低限の量に抑えることも、同時に解決しなければならない課題である。

【0006】さらに、一定の処理速度という制約の中で、連続的にしかも常に均等な味付け処理を実現することも必要となってくる。

【0007】これらの点に関しては、上記公報に記載の装置は何ら配慮がなされておらず、消費者やメーカーのニーズを満足させるまでには至っていない。

【0008】さらに、この種の装置を用いた場合、味付け後の製品は、組合せ計量装置等の計量装置に供給され、所定重量に計量された後、さらに包装装置に供給されるのが通例であり、そのため、次のような不具合の発生が考えられるのである。

【0009】つまり、計量装置には調味料が付着された製品が供給されるから、該計量装置への製品供給経路や該計量装置各部の製品が直接接触する部位に調味料が付着することになる。そのため、同一のシステムを用いて異なる味付けの商品を処理する場合に、味を一定に保持

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するため、商品替えのたびにシステムを停止させて、上記供給経路や計量装置の各部を清掃しなければならないことになる。

【0010】また、この種の商品に用いられる調味料は塩分を含むものが多く、そのため、この調味料が付着した供給経路や計量装置各部で錆が発生し易くなり、食品衛生上の問題を生じたり、システムの作動不良を生じたりすることになり、また、これを防止するために一層頻繁に清掃を行わなければならないことになる。

【0011】そこで、本発明は、この種の商品の味付け装置や味付け処理システムとして、一定且つ均等な味付け処理が安価に可能であり、しかも清掃部位が少なく、商品替え時の作業性に優れた装置やシステムを提供することを課題とする。

【0012】

【課題を解決するための手段】上記課題を解決するため、本願発明は次のように構成したことを特徴とする。

【0013】まず、請求項1に記載の発明は、落下中の中間製品に粉体調味料を静電作用によって付着させることにより、該中間製品を味付けする商品の味付け装置に関するもので、中間製品の落下経路に粉体調味料を帯電させて散布する帯電散布手段と、該帯電散布手段に粉体調味料をエアと共に供給する調味料供給手段と、粉体調味料の散布量が一定となるように制御する制御手段とが備えられていることを特徴とする。

【0014】この発明によれば、中間製品の落下経路には散布量が一定とされた粉体調味料が浮遊するから、該粉体調味料は中間製品の表面に一定量付着されることになる。しかも、粉体調味料は帯電されているから、中間製品に均等に付着されることになる。したがって、味付け製品の品質が安定して確保されるようになる。

【0015】特に、一方向から粉体調味料を散布する方式であると、粉体調味料は中間製品に良好に付着しなく、しかも該中間製品が平面的な形状であると、粉体調味料は中間製品の片面に偏って付着する虞があるが、上記発明によれば、静電作用を利用するから、これらの懸念は軽減される。

【0016】そして、請求項2に記載の発明は、上記請求項1の味付け装置において、制御手段は、調味料供給源から調味料供給手段に供給される粉体調味料の量を制御することを特徴とする。

【0017】また、請求項3に記載の発明は、上記請求項1または請求項2の味付け装置において、制御手段は、調味料供給手段によるエアの供給時間を制御することを特徴とする。

【0018】そして、請求項4に記載の発明は、上記請求項1から請求項3のいずれかの味付け装置において、制御手段は、調味料供給手段によるエアの流量を制御することを特徴とする。

【0019】これらのいずれの発明によっても、エアと

共に供給されて帯電散布手段により散布される粉体調味料の散布量を精度よく制御することが可能となるから、味付け製品の品質が一層安定して確保されるようになる。

【0020】特に、エアの供給時間や流量といった条件を一定とした上で、このエアに供給する粉体調味料の量を制御することにより、容易に所望の粉体調味料の散布量が得られる。

【0021】また、請求項5に記載の発明は、上記請求項1から請求項4のいずれかの味付け装置において、複数の帯電散布手段が備えられていることを特徴とする。

【0022】この発明によれば、複数の帯電散布手段によって粉体調味料を散布できるから、該粉体調味料を中間製品に一層均等に付着させることができるように、粉体調味料の散布量をさらに一層精度よくしかも細かく制御することができる。また、例えば1つの帯電散布手段が作動を停止した場合でも、粉体調味料の散布量が一定となるように残りの帯電散布手段を制御することができるから、生産性の維持が可能となる。

【0023】さらに、請求項6に記載の発明は、上記請求項5の味付け装置において、複数の帯電散布手段は、中間製品の落下経路の周囲にはば均等な間隔で配置されていることを特徴とする。

【0024】この発明によれば、複数の方向からしかも均等な間隔を置いて粉体調味料が散布されるから、該粉体調味料を中間製品により一層均等に付着させることができるようになる。特にポテトチップ等のように平面的な形状の中間製品の場合、一方からのみ粉体調味料を供給すると、調味料が該中間製品の片面に偏って付着するという虞を、一層軽減することが可能となる。

【0025】そして、請求項7に記載の発明は、上記請求項5の味付け装置において、複数の帯電散布手段は、中間製品の落下経路に沿って上下位置に分配されて配置されていることを特徴とする。

【0026】この発明によれば、中間製品の落下方向における粉体調味料の散布空間の長さが長くなるから、例えば中間製品の落下速度を速めた場合でも、粉体調味料を中間製品に良好に付着させることができるようになる。

【0027】また、請求項8に記載の発明は、上記請求項1から請求項7のいずれかの味付け装置において、帯電散布手段による粉体調味料の散布方向は、中間製品の落下経路と直交しない方向であることを特徴とする。

【0028】この発明によれば、粉体調味料は、落下する中間製品の流れを阻害しないように散布されるから、中間製品の円滑な落下並びに落下速度が維持され、高速運転状態が保たれることとなる。

【0029】また、例えばこの味付け装置の下方に包装装置が配置されている場合、落下中の中間製品の落下速度が急変すると、包装装置における包材シール部への中

間製品の噛み込み等の不具合が生じる虞があるが、上記発明によってこの懸念が軽減されるようになる。

【0030】一方、請求項9に記載の発明は、商品の味付け処理システムに関するもので、請求項1から請求項8のいずれかに記載の味付け装置が備えられていると共に、この味付け装置の上方に、中間製品を所定重量に計量する計量装置が配置され、且つ上記味付け装置を構成する制御手段は、上記計量装置で計量された中間製品の重量に応じた所定量となるように、粉体調味料の散布量を制御することを特徴とする。

【0031】通常計量装置から排出されて落下する中間製品の重量に応じて、散布された粉体調味料の消費量は増減するが、この発明によれば、例えば計量装置において製品重量の切り替えがあった場合、それに応じて粉体調味料の散布量が変更されるので、粉体調味料の散布過多による中間製品に付着されなかった粉体調味料の増加や、粉体調味料の散布過少による中間製品の味付け不足等の不具合が防止され、常に一定の味付けがなされた製品が得られるようになる。

【0032】また、中間製品は、計量装置で所定重量に計量された後、下方の味付け装置によって味付けされるから、計量装置への製品供給路や該計量装置各部の製品が直接接触する部位に調味料が付着することがなくなり、商品替え時におけるこれらの部位の清掃が不要となる。

【0033】そして、請求項10に記載の発明は、上記請求項9の味付け処理システムにおいて、味付け装置の下方に、味付け済みの商品を包装する包装装置が配設され、且つ、制御手段は、該包装装置または計量装置の運転速度に応じた所定量となるように、粉体調味料の散布量を制御することを特徴とする。

【0034】通常包装装置または計量装置の運転速度、言い換えば味付け装置における単位時間当たりの中間製品の落下供給回数に応じて、散布された粉体調味料の消費量は増減するが、この発明によれば、例えば包装装置または計量装置に運転速度の切り替えがあった場合、それに応じて粉体調味料の散布量が変更されるので、上記請求項9の発明同様、粉体調味料の散布過多による中間製品に付着されなかった粉体調味料の増加や、粉体調味料の散布過少による中間製品の味付け不足等の不具合が防止され、常に一定の味付けがなされた製品が得られるようになる。

【0035】その上で、計量装置から味付け装置を経て包装装置へ製品が落下しながら供給されることになり、計量、味付け、包装の各作業が連続的に能率よく行われることになる。

【0036】

【発明の実施の形態】以下、本発明の実施の形態に係る商品の味付け処理システムについて説明する。

【0037】図1に示すように、この味付け処理システ

ム1は、中間製品を搬送すると共に分配供給するための搬送装置2の下流に配置されており、組合せ計量装置10と、帯電装置20と、味付け装置30と、粉体調味料回収装置40と、包装装置50とを有している。

【0038】上記組合せ計量装置10は、搬送装置2の分散供給口2aの下方に対向して設置された加振式の分散テーブル11と、該分散テーブル11の周間に放射状に配置された複数の放射トラフ12…12と、該放射トラフ12…12に対応して円形配置された上下一対のプールホッパ13…13及び計量ホッパ14…14と、上記計量ホッパ14…14の下方に設置された集合シート15と、該集合シート15の下端部の排出口直下に設置されたタイミングホッパ16とを備えている。また、上記タイミングホッパ16の下方に、中間製品の通過を検出する光電式の物品センサ17a、17bが設置されている。

【0039】こうすることにより、分散テーブル11上に供給された中間製品は、放射トラフ12…12に分散供給されたのちプールホッパ13…13を経て計量ホッパ14…14に供給され、該計量ホッパ14…14により中間製品の重量が計量されて組合せ演算が行われるようになっている。そして、組合せ演算の結果、所定重量となる組合せに対応する計量ホッパ14…14から中間製品が排出され、集合シート15で集合、排出されてタイミングホッパ16に貯留される。該タイミングホッパ16は、下方の包装装置50からの信号に基づいて開閉動作するもので、例えば、包装装置50から排出要求信号があると開動作し、上記中間製品は下方に排出される。そして、物品センサ17a、17bにより、排出されて落下する中間製品の通過が検出される。

【0040】また、上記帶電装置20は、中間製品の落下経路を挟んで対向するように配設され、一方が高圧電源21に接続されると共に他方が接地された一対の電極22a、22bを有している。こうすることにより、落下中の中間製品は、これらの電極22a、22b間に形成される電界空間を通過する間に所定の極性に帯電される。

【0041】そして、本発明の特徴部である上記味付け装置30は、上記帶電装置20によって所定の極性に帯電された中間製品を取り込む取込シート31と、該取込シート31の下端部開口に臨んで上端部が開口する味付けシート32とを備えている。

【0042】上記味付けシート32には、取込シート31の下端部開口の下方且つ中間製品の落下経路の周間に均等な間隔を置いて、粉体調味料を味付けシート32内方に散布すると共に粉体調味料を所定の極性に帯電させる一対の静電ガン33、33が取り付けられている。そして、これらの静電ガン33、33には、圧縮エアの供給源であるコンプレッサ34から延びる調味料供給手段としての配管35の比較的下流側で分岐する分歧

管35a, 35bがそれぞれ接続されている。また、上記配管35の比較的上流側で分岐する分岐管35cには、スクリュウ落下式の調味料定量供給機構36が接続されている。この調味料定量供給機構36の一方の端部は、粉体調味料を貯留する調味料タンク37内に挿入されている。

【0043】ここで、上記静電ガン33, 33について、図2で詳しく説明する。

【0044】一対の静電ガン33, 33は、同一平面上に且つ粉体調味料を散布する端部が互いに対向するよう味付けシート32の周壁に取り付けられている。また、各静電ガン33, 33の粉体調味料を散布する端部には、味付けシート32の内方に向かうほどラッパ状に拡径する形状とされたデフレクタ33a, 33aがそれ備えられており、該端部を介して散布される粉体調味料は、矢印Aで示すように拡散される。

【0045】次に、上記調味料定量供給機構36について、図3で詳しく説明する。

【0046】この調味料定量供給機構36は、調味料タンク37内の粉体調味料を単位時間当たり一定量だけ取り出し、矢印Bで示すように配管35に落下供給するもので、駆動モータ36aと、該駆動モータ36aの出力軸36a'の先端部側に取り付けられて、粉体調味料を図面右方から左方へ搬送するためのスクリュウ36bと、これら出力軸36a'とスクリュウ36bとを収容する外筒部材36cとを有している。そして、調味料タンク37内に挿入された上記外筒部材36cの図面右方の所定箇所に、粉体調味料を該外筒部材36c内に取り込むための開口36c'が設けられている。

【0047】さらに、駆動モータ36a寄りの外筒部材36cの所定箇所には、上部にエアを取り込むエア口36dが設けられると共に、下部に配管35の分岐管35cが接続されている。

【0048】また、図1に示すように、分岐管35cと、分岐管35aないし35bとで挟まれた配管35の途中に、矢印Cで示す粉体調味料を含むエアの流れを開閉制御すると共に流量制御するための切換バルブ38が設けられている。

【0049】そして、上記味付け装置30の制御システムについて説明すると、図4に示すように、該味付け装置30には、これを総括的に制御する制御部39が備えられており、この制御部39は、味付け装置30に備えられた静電ガン33, 33と、調味料定量供給機構36と、切換バルブ38とに作動制御のための制御信号を出力する。

【0050】また、制御部39は、組合せ計量装置10からの中間製品の組合せ計量信号や、組合せ計量装置10の物品センサ17a, 17bからの物品通過信号を入力し、また、粉体調味料回収装置40の切換バルブ44(後述)に作動制御のための制御信号を出力し、そし

て、包装装置50からの排出要求信号を入力する。

【0051】さらに、上記制御部39は、帶電装置20から例えば電極22aへの印加電圧等のデータを入力すると共に、帶電装置20に作動制御のための制御信号を出力する。

【0052】一方、図1に示すように、上記粉体調味料回収装置40は、上記味付けシート32の下部が嵌合すると共に包装装置50に臨んで下端部が開口する排出シート41を備えており、該排出シート41の比較的上部に設けられた一対の吸引口41a, 41aと、余分な粉体調味料を吸引回収するサイクロン回収機42とが、配管43で接続された構成とされている。また、上記サイクロン回収機42は、バキュームポンプ42aにより排気される。そして、サイクロン回収機42の手前側の配管43の途中には、粉体調味料の回収をオンオフ制御するための切換バルブ44が設けられている。

【0053】次に、上記味付け処理システム1の動作について説明する。

【0054】まず、搬送装置2に設けられた分配供給口2aを介して、味付け処理システム1の組合せ計量装置10に供給された中間製品は、該組合せ計量装置10によって所定重量に計量されて下方に排出されると、物品センサ17a, 17bによりその通過が検出される。味付け装置30の制御部39は、物品通過信号を入力すると、静電ガン33, 33を作動させる。

【0055】組合せ計量装置10から排出されたのち、帶電装置20によって所定の極性に帶電された中間製品は、取込シート31を経て、味付けシート32に落下供給される。一方、調味料定量供給機構36によつて、調味料タンク37から単位時間当たり一定量の粉体調味料が取り出され、分岐管35cを介して配管35へ落下供給されると、粉体調味料は、配管35内を矢印Cで示すように圧縮エアで搬送される。そして、該粉体調味料は、分岐管35a, 35bを介して一対の静電ガン33, 33から味付けシート32内方に散布されると共に、所定の極性、つまり上記中間製品の極性とは逆の極性に帶電される。

【0056】その場合、調味料定量供給機構36に備えられたスクリュウ36bの回転によって、図3右方から左方に搬送されてきた粉体調味料は、エア口36dから吸引されるエアにより分岐管35cを介して配管35に、単位時間当たり一定量だけ安定して落下供給される。その結果、中間製品の落下経路には、散布量が一定とされた粉体調味料が浮遊し、この粉体調味料は、落下する中間製品の表面に一定量付着されることになる。したがって、所定の味付けがなされた味付け製品が得られる。

【0057】しかも、中間製品の極性とは逆の極性に帶電されて味付けシート32内方で分散浮遊している粉体調味料の雰囲気内を、所定の極性に帶電された中間製品が落下することから、静電作用によって粉体調味料は

中間製品に確実に且つ全表面に均等に付着されることになる。

【0058】そして、味付け装置30に備えた制御部39により、帯電装置20からの入力データに基づいて、帯電装置20及び静電ガン33、33に制御信号を出力するようにしたから、中間製品及び粉体調味料の帯電の程度をそれぞれ変更することが可能となる。したがって、例えば、湿度の高い環境下での味付け処理作業においては、中間製品と粉体調味料との間の電位差を大きくすることにより、常時一定且つ均等に中間製品に粉体調味料を付着させることができるようになる。

【0059】また、制御部39により調味料定量供給機構36のスクリュウ36bの回転数を制御すると、配管35に落下供給される粉体調味料の量を変更することができるから、また、配管35の途中に設けられた切換バルブ38の開閉制御により粉体調味料を含むエアの供給時間を制御すると、あるいは流量制御により粉体調味料を含むエアの流量を制御すると、静電ガン33、33に供給される粉体調味料の量を変更することができるから、粉体調味料の散布量が任意に変更可能となると共に、散布量を精度よく制御することが可能となる。

【0060】そして、一対の静電ガン33、33を、均等な間隔で互いに対向するように味付けシート32を取り付けたから、1つの静電ガン33を取り付けた場合に比較して、粉体調味料の散布量をさらに一層精度よくしかも細かく制御することが可能となるばかりでなく、2方向からしかも均等な間隔を置いて粉体調味料が散布されるから、特にポテトチップ等のように平面的な形状の中間製品の場合でも、片面に偏って粉体調味料が付着するという不具合が軽減される。

【0061】また、上記静電ガン33、33の粉体調味料を散布する端部に、それぞれデフレクタ33a、33aを備えたから、粉体調味料は中間製品の落下経路と直交しない方向に散布されることとなり、散布される粉体調味料が中間製品の円滑な落下を阻害することがなくなる。したがって、高速運転状態が保たれることとなる。

【0062】さらに、上記したように、制御部16により粉体調味料の散布量を任意に変更することが可能となったから、製品重量の切り替えがあった場合、組合せ計量装置10における中間製品の組合せ計量信号を入力することにより、中間製品の重量に応じた所定量となるように、粉体調味料の散布量を制御することができる。その結果、粉体調味料の散布過多あるいは過少といった不具合が防止され、常に一定の味付けがなされた製品が得られるようになる。

【0063】その上で、中間製品は、組合せ計量装置10で所定重量に計量された後、下方の味付け装置30によって味付けされるから、組合せ計量装置10への製品供給路や該組合せ計量装置10各部の製品が直接接触する部位に調味料が付着することがなくなり、商品替え時

におけるこれらの部位の清掃が不要となる。

【0064】また、同じく上記したように、制御部16により粉体調味料の散布量を任意に変更することが可能となったから、組合せ計量装置10または包装装置50に運転速度の切り替えがあった場合、運転速度に対応する組合せ計量装置10における物品通過信号の入力回数または包装装置50からの排出要求信号の入力回数に応じて所定量となるように、粉体調味料の散布量を制御することができる。その結果、粉体調味料の散布過多あるいは過少といった不具合が防止され、常に一定の味付けがなされた製品が得られるようになる。

【0065】その上で、組合せ計量装置10から味付け装置30を経て包装装置50へ製品が落下しながら供給されることになり、計量、味付け、包装の各作業が連続的に能率よく行われることになる。

【0066】そして、上記包装装置50によって所定の包材で包装された包装済み製品は、例えば、重量チェック、シールチェック等の品質検査機器に受け渡される。

【0067】一方、味付けシート32内方に散布されて中間製品に付着されなかった粉体調味料は、切換バルブ44を開動作させることによって、矢印D(図1参照)で示すように排出シート41を介してサイクロン回収機42で回収されるから、粉体調味料の無駄が防止されると共に、排出シート41の下方に配置された包装装置50において、味付け製品に加えて余分な調味料が供給されて、包み込まれるといった不具合が回避される。さらに、回収された粉体調味料の再利用が可能となる。

【0068】なお、上記実施の形態において、一対の静電ガン33、33を用いたが、さらに多数の静電ガン33…33を用いてもよい。こうすることにより、味付けシート32内方に浮遊する粉体調味料の散布量を一層容易に制御することができるようになる。そして、上記一対の静電ガン33、33は、中間製品の落下経路の周囲に設けられているから、これらの静電ガン33、33により散布される粉体調味料は落下中の中間製品の表面に均等に付着するが、さらに多数の静電ガン33…33を用いると、粉体調味料は中間製品の表面により一層均等に付着することとなり、味付けの均等化が図られる。

【0069】また、上記実施の形態において、複数の静電ガン33、33を、中間製品の落下経路に沿って上下位置に分配して配置した場合については説明を省いたが、この場合においても上記同様、粉体調味料は落下中の中間製品の表面に均等に付着されることになる。さらに、中間製品の落下方向における粉体調味料の散布空間の長さが長くなるから、例えば中間製品の落下速度を速めた場合でも、粉体調味料を中間製品に良好に付着させることができるようになる。

【0070】そして、上記実施の形態において、配管35への粉体調味料の供給に、該配管35に対して水平配

置したスクリュウ36bによるスクリュウ落下式の調味料定量供給機構36を用いたが、スクリュウを上記配管35に対して垂直配置したものを用いてもよい。また、スクリュウ落下式の調味料定量供給機構36に代えて、その他粉体の少量定量搬送に適した電磁フィーダ式や超音波搬送式等の定量供給機構を用いてもよい。

【0071】また、上記実施の形態において、タイミングホッパ16や取込シート31を用いたが、設置スペースの制約等の理由によりこれらを省くことができる。

【0072】そして、上記実施の形態において、制御部39により帯電装置20と味付け装置30とが連動するように制御したが、例えば、格別精度のよい付着量の味付け処理を必要としない場合には連動させなくてもよい。

【0073】また、上記実施の形態において、中間製品は集合シート15に接触しながら落下するため、該集合シート15を接地しておけば、帯電装置20を省くことができる。さらに、制御部39が組合せ計量装置10からの排出信号を入力するようにすれば、物品センサ17a, 17bを省くことができる。

【0074】

【発明の効果】以上説明したように、本発明によれば、粉体調味料の散布量を一定とするように制御したから、一定の味付けがなされた味付け製品が安定してしかも安価に確保される。また、静電作用によって、粉体調味料\*

\*は中間製品に確実に且つ均等に付着される。その上で、計量装置から排出され、落下中の中間製品に粉体調味料を付着させて味付け製品を得るようにしたから、調味料が接触する部位が低減され、清掃性や作業性に優れた味付け処理システムが実現する。本発明は、特に多様化する嗜好に対応可能な食品の組合せ計量分野に好適である。

【図面の簡単な説明】

【図1】 本発明の実施の形態に係る味付け処理システムの概略構成図である。

【図2】 図1のアーア線に沿う要部拡大断面図である。

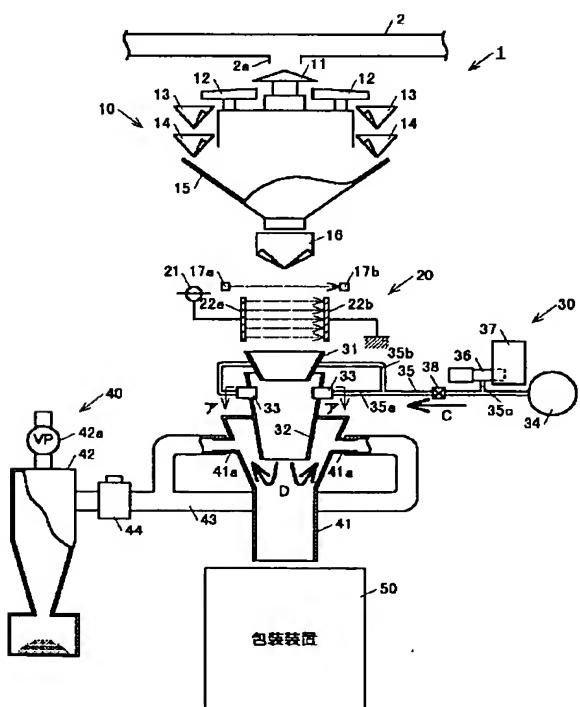
【図3】 調味料定量供給機構を説明するための一部破断要部拡大図である。

【図4】 制御システム図である。

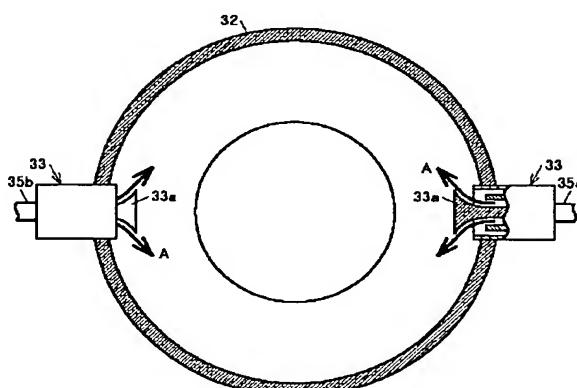
【符号の説明】

- |    |                   |
|----|-------------------|
| 1  | 味付け処理システム         |
| 10 | 組合せ計量装置(計量装置)     |
| 30 | 味付け装置             |
| 20 | 33 静電ガム(帯電散布手段)   |
| 35 | 35 配管(調味料供給手段)    |
| 37 | 37 調味料タンク(調味料供給源) |
| 39 | 39 制御部(制御手段)      |
| 50 | 50 包装装置           |

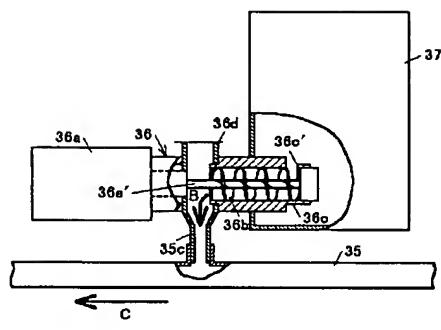
【図1】



【図2】



【図3】



【図4】

